National Ocean Service

International Strategic Plan 2007-2011







National Ocean Service
National Oceanic and Atmospheric Administration
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"Just as the well-being of U.S. citizens and the productivity of the U.S. economy depend on the ocean, the same holds true for most other nations… It is in America's interest to work with the international community to preserve the productivity and health of the oceans and to secure cooperation among nations everywhere in managing marine assets wisely."

An Ocean Blueprint for the 21st Century
The U.S. Ocean Commission on Ocean Policy
Advancing International Ocean Science and Policy

Message from the Assistant Administrator

Across the globe, our vulnerability to the negative impacts of environmental change is increasing. In the 21st century, we must act to address growing pressures from the accelerating concentration of populations and economic activity in coastal zones and acute events such as Hurricane Katrina, the Indian Ocean Tsunami or coral reef bleaching. The challenge is to save not only the last, best places, but manage the coastal landscape and ocean space to adapt to global change, while providing for economic growth of coastal communities, and sustainable management of coastal resources.

Responding successfully to environmental stresses increasingly requires NOS to exercise leadership in reaching across our borders to engage global partners. This NOS International Strategy underscores our corporate commitment to collaborate with the international community to build coastal resilience to sustain coastal communities and improve marine health and productivity. Coastal resilience addresses the ability of an ecosystem or coastal community to recover from chronic or acute stressors. This strategy proposes a NOS contribution – based on our core products and services - to build coastal resiliency at the national and international levels.

As America's premier civilian ocean agency, NOAA's National Ocean Service works internationally to: ensure safe and efficient marine transportation; implement sustainable resource management and conservation practices; provide leadership in Earth science; and advance international ocean policy issues. This International Strategy will mobilize NOS international efforts to promote a comprehensive approach to international challenges by focusing on the following priorities:

- Observe and predict the Earth system.
- Improve and maintain the viability of marine and coastal ecosystems.
- Mitigate and adapt to climate change and vulnerability.
- Reduce vulnerability to natural and anthropogenic hazards.
- Promote safe and environmentally sound navigation.

Addressing these five goals requires NOS and NOAA to think globally, act locally, and partner internationally to help restore and maintain coastal resilience. NOS will collaborate globally to advance the continued enjoyment, health, and productivity of the oceans and coasts in the U.S. and abroad.

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EXECUTIVE SUMMARY

Our growing reliance on the oceans for sustainable development, cultural heritage, and ecosystem services accelerates international interdependence within the global ecosystem. Securing socioeconomic development and environmental protection at home will require international collaboration at regional and global levels. Degradation of coastal habitat, declines in fisheries productivity, heightened coastal vulnerability to marine hazards, and changing ocean chemistry are just a few of the symptoms of the need to enhance the international community's resilience to natural and anthropogenic environmental stressors.

The NOS envisions "An informed global community that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions to foster coastal resilience."

To build coastal resilience internationally, the National Ocean Service's International Strategy organizes its activities to achieve five goals and associated actions:

NOS International Strategy Goals	Actions to Implement the Goal
Observe and Predict the Earth System	• Advance international understanding and application of NOS integrated data products and services, in particular V-Datum. • Increase the spatial and temporal coverage of multi-purpose coastal observing platforms in the Caribbean and Pacific, in particular to support biological, sea-level, and geodesy studies.
Improve and Maintain the Viability of Marine and Coastal Ecosystems	• Develop and exchange U.S. best practices to improve ecosystem-based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally. • Develop and exchange modeling and predictive capabilities to enhance ecosystem-based approaches to management by understanding and managing the impacts of contaminants, diseases, and nutrient enrichment, with special emphasis on harmful algal blooms. • Develop specific regional initiatives to reduce key threats and build resilient marine and coastal ecosystems including a "Resilient Caribbean Ecosystems and Communities" initiative that integrates NOS/NOAA delivery of products and best management practices in this and other priority target regions.
Mitigate and Adapt to Impacts of Climate Change and Vulnerability	• Develop and share tools to understand ecosystem resilience to climate variability and change and their impacts on coastal communities, including ocean acidification, sea level rise, and coral bleaching prediction. • Develop and share tools for adaptive management working with the coastal management and MPA communities, in particular in the Caribbean and Pacific.
Reduce Vulnerability to Natural and Anthropogenic Hazards	• Develop NOAA international marine debris strategy. • Share NOS tools and methodologies in hazard prediction, preparedness, mitigation, and response with priority regions and countries.
Promote Safe and Environmentally Sound Navigation	• Facilitate improvement of wider Caribbean and Latin American regional hydrographic and cartographic capacity by collaborating in activities that demonstrate the importance of hydrographic information for safe navigation, protection of the marine environment, and sustainable economic growth. • Integrate environmental, navigation, and geospatial information in marine and coastal management, navigation policy, maritime infrastructure development, and management tools.

These goals and actions provide the compass for a new corporate pursuit of international collaboration both formally, through more than 25 existing NOS international agreements, as well as informally through partnerships and scientific exchange.

This Strategy completes the second stage of a three-part international planning process. First, in January 2007, NOS adopted the International Operational Framework, which defines a deliberative process for building NOS' international priorities and positions through the NOS International Coordination Council (NICC). Second, this International Strategy charts new policy direction, articulates the five goals to foster coastal resilience and identifies priorities for the International Annual Action Plan. Third, NOS will develop an International Annual Action Plan with an agency-wide perspective on NOS international engagements with associated performance measures, resource plans, and programmatic integration to ensure international engagements have the greatest societal benefit and investment return for our efforts.

Table of Contents

Tables and Figures

I. Strategy for Fostering Coastal Resilience: Building Capacity to Understand and Adapt Through International Collaboration

A. Urgency for Enacting the NOS Vision for Fostering Coastal Resilience

Much of the world's projected 1.5 billion population growth and three-to-six fold projected increase in gross world product over the next 50 years will be concentrated within 100 miles of the sea.[1] This convergence of growing human communities and rising economic activity will magnify risks from natural disasters and impacts of climate change, as well as continue to increase pressures on the ocean's most productive coastal waters and coastal habitats. Loss of ecosystem services, for example, shoreline protection and fish protein, would severely imperil coastal communities in the U.S. and abroad.

The international community must address a shared global challenge: stop the decline and reverse the degradation of marine and coastal ecosystems and simultaneously increase ecosystem services that are the foundation for sustainable and resilient coastal communities.

Responding to this shared global challenge requires collaboration between the U.S. and the international community because:

- The influence and use of Earth's oceans and atmosphere affect the health, economy and ecosystems of every nation;
- Globalization increases the interdependence of our economies and countries, amplifying human impacts on natural ecosystem processes, often across national boundaries;
- New capabilities developed by or with our global partners help the U.S. and international community foster sustainable and resilient coastal communities; and
- Our ability to ensure prosperous, resilient and healthy U.S. coastal communities will depend in part on actions by those beyond the borders of the United States.

The Millennium Ecosystem Assessment (2005) states:

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.

People are increasingly occupying regions and localities that are exposed to extreme events, thereby exacerbating human vulnerability to natural hazards. This trend, along with the decline in the capacity of ecosystems to buffer from extreme events, has led to continuing high loss of life globally and rapidly rising economic losses from natural disasters.

The total amount of reactive, or biologically available, nitrogen created by human activities increased nine-fold between 1890 and 1990, with most of that increase taking place in the second half of the century in association with increased use of fertilizers.

[1] Millenium Ecosystem Assessment 2005. (p. 15, 43, 34)

Conrad C. Lautenbacher, Jr., Vice Admiral, U.S. Navy (Ret.), Undersecretary of Commerce for Oceans and Atmosphere has stated:

> "Countries such as the United States have a responsibility for stewardship of the marine ecosystem and for setting standards to protect and manage the shared resources and harvests of the oceans. Believing that it is possible to balance sustainable economic development and healthy functioning of marine ecosystems, we seek to provide an example for the rest of the world by comprehensively managing resources of the world's oceans and coasts."[2]

The President of the United States called for the nation to "[enhance] ocean leadership and coordination," recognizing that the "oceans are inherently global in nature."[3] Additional senior policy assessments highlight the value of marine and coastal ecosystem services to sustainable coastal communities while underscoring increased degradation of marine and coastal ecosystems.

The President's agenda requires the National Ocean Service (NOS) to mobilize its products and services to:

- Provide international policy and technical leadership in integrated management of the oceans and coasts.
- Advance international scientific research and observing networks.
- Support capacity building exchanges that build and share decision support tools for ecosystem forecasting.
- Communicate the need for and help build international capacity for ecosystem management for coastal resilience.

NOS has established world class capabilities in ecosystem-based management and a long history of international engagement to address the President's agenda.

The NOS International Vision

An informed global community that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best informed social and economic decisions to foster coastal resilience

This Vision requires NOS to strengthen the capacity of the international community to foster coastal resilience. In the context of the NOS International Strategy, "Coastal Resilience" refers to the capacity of a system, community or society potentially exposed to acute or chronic natural or anthropogenic change, to adapt in order to reach and maintain an acceptable level of functioning and structure. This is determined in part by the degree to which the social system increases its capacity for learning from past experience for better future protection and to improve risk reduction measures and enhance ecosystem function. The continued growth of coastal communities involves an increasing reliance upon the steady and stable provision of coastal and marine ecosystem services. These services range from mitigating storm damage to providing the resources consumed and enjoyed by coastal communities. Ecosystem services are a critical foundation for coastal resilience.

[2] NOAA Strategic Plan
[3] U.S. Ocean Action Plan

The NOS International Strategy recognizes the dynamic nature of oceans, coasts, and atmosphere and the need for a comprehensive ecosystem-based management approach to build resilience capacity in light of the interconnectedness of society and natural ecosystems. NOS will deliver its products and services using an integrated approach to address the competing natural and human forces that may undermine coastal resiliency.

This Strategy integrates the engagement of NOS program offices in international activities while maximizing benefits to the U.S. and global community. This integrated engagement will be implemented through five resilience goals:

Observe and Predict the Earth System

- Strengthening the earth observing system is required at local, regional, national, and global scales, and will provide essential understanding of the dynamic and interconnected role of the oceans, coasts, and atmosphere in the global ecosystem. It will allow the forecasting of future environmental conditions and management of human impacts on those ecosystems.

Improve and Maintain the Viability of Marine and Coastal Ecosystems

- Improving the viability of marine and coastal ecosystems will require observing and understanding ecosystem and human use trends, utilizing this knowledge to inform the development and application of best management practices, and to increase the productivity and stability of these ecosystems.

Mitigate and Adapt to Impacts of Climate Change and Variability

- Improving adaptation, preparedness, and response strategies will address diverse regional impacts of climate variability (such as potentially catastrophic coastal hazards, ecosystem change, and loss of sea ice) to promote resilient coastal communities.

Reduce Vulnerability to Natural and Anthropogenic Hazards

- Reducing vulnerability to hazards will require mobilizing data and capabilities to improve understanding of threats, target regional approaches to diverse vulnerabilities, and communication with vulnerable stakeholders and communities to promote coastal resilience strategies for risk reduction.

Promote Safe and Environmentally Sound Navigation

- Promoting safe and environmentally sound navigation will require enhanced access to hydrographic, geodetic, and oceanographic data to increase the accuracy of forecasts, availability of electronic nautical charts, and timely geospatial positioning information that is critical for air, sea, and surface transportation in addition to coastal management.

Each goal builds on (a) NOS' and NOAA's existing capabilities for observations, modeling and predictions, and research and development to support social and economic decisions that are essential to ecosystem management and sustainable coastal communities; (b) world class best management practices; (c) more than 25 formal international partnership arrangements and international outreach which provide platforms to maximize peer-to-peer exchanges and capacity building both in the US and abroad; (d) leadership opportunities to shape international technical standards and policy; and (e) substantial existing activities

supported through a range of partnerships and new activities that will build synergies and reinforce activities across the five resilience goals.

Each goal is presented in Section B with associated core objectives which, if implemented in an integrated approach across NOS, will help the global community enhance coastal resiliency.

B. Five Goals and Associated Objectives to Foster Coastal Resilience

This Strategy identifies NOS international core objectives to realize these goals. The objectives arise from an analysis of international challenges and NOS' capabilities to address these issues. Table 1 summarizes the *objectives* while priority international *actions* are summarized in Table 2.

Table 1. NOS Objectives to Foster Coastal Resilience

	Observations	Ecosystems	Climate	Hazards	Transportation
NOS Will…	**Inform and support better decision-making for coastal and ocean management through improved access to coordinated, comprehensive, and sustained earth observations and information.**	**Strengthen U.S. and international capacity for stewardship of ocean and coastal ecosystems through international partnerships to develop, exchange, and implement:** • **Scientific results.** • **Data and information.** • **Products and services.** • **Best management practices with international partners.**	**Promote integration of information concerning climate science to build domestic and international capacity that can support effective policy and decision-making to mitigate and adapt to impacts of climate change and variability.**	**Reduce vulnerability to natural and anthropogenic hazards through building international capacity in order to understand, forecast, prepare for, respond, and adapt to hazards.**	**Promote safe and environmentally sound navigation of goods and people through the development and implementation of global hydrographic, geodetic, physical oceanographic, and environmental standards.**
Objectives	Increase national and global access to coastal and ocean observation capabilities.	Build and advance U.S. and international capacity to monitor and assess health trends and conditions of ocean and coastal ecosystems to improve management efforts.	Develop and improve tools and technologies to better understand and adapt to the impacts of climate change by assisting and exchanging capabilities with key international partners.	Engage and collaborate with our international partners to increase the international capability at the regional scale to prevent, prepare for, respond to, and mitigate negative impacts of physical and biological natural hazards to coastal ecosystems.	Participate and lead within international fora to ensure that standards and policies are consistent with U.S. interests.
	Increase the spatial and temporal coverage of multipurpose coastal observing platforms in the Caribbean and Pacific, in particular to support biological, sea level, and geodesy studies.	Advance understanding of ocean and coastal ecosystems through collaborative science and modeling to improve resource management.	Transfer NOAA tools and information to better understand and develop adaptation strategies to address the impacts of climate change.	Engage and collaborate with our international partners to create regional plans for increasing international capabilities to prevent, prepare for, and respond to anthropogenic hazards in coastal ecosystems, such as oil and chemical spills, ship groundings, land-based pollution, and over-fishing.	Support international collaborative capacity-building efforts to mutually improve geodetic, hydrographic, and tidal capabilities in interested countries, including Guatemala, Honduras, Mexico, Korea, Canada, and Suriname.
	Train and educate developing countries, and other previous non-users, through partnerships and capacity building, to improve access to and effective utilization of technology, observations, and data and products to improve coastal and ocean management and decision-making.	Build capacity and promote exchange of technology, tools, training, information and other resources to protect, manage, and restore ocean and coastal ecosystems.	Provide technical assistance to international partners especially to coastal decision-makers and vulnerable communities.		Increase inclusion of a hydrographic and geodetic component in environmental projects funded by international donor organizations, particularly in Latin America and the Caribbean Sea region.

Observe and Predict the Earth System

Problem

The ability to observe and forecast change in the coastal and ocean environment on local, regional, and global scales is critical to making informed decisions that will protect human life and ecosystem integrity. Currently there are a multitude of independent national and international marine, terrestrial, and atmospheric observing and monitoring systems that operate in the open ocean and coastal zone. The Strategic Plan for the U.S. Integrated Earth Observation System (IEOS) seeks to "enable a healthy public, economy, and planet through an integrated, comprehensive, and sustained Earth observation system." This national Strategy provides the national mechanism to implement the Global Earth Observing System of Systems (GEOSS), and underscores the need to integrate observing systems across the land-coast-ocean-atmosphere continuum. The Global Ocean Observing System's coastal program, a component of GEOSS, helps to establish a coastal observing system that provides data and information required to mitigate and manage the impacts of natural hazards, climate change, and human activities on coastal systems and their capacity to provide goods and services to society.

"Improving our ability to detect and predict changes in terrestrial, coastal, and marine ecosystems is an international priority. If we are going to manage the "health" of these ecosystems then we need to observe and forecast habitat modification and loss, changes in biodiversity, eutrophication, harmful algal events, invasions of non-native species, and diseases and mass mortalities of marine organisms." VADM Lautenbacher speech to International Oceanographic Commission, June 2005.

Tropical cyclones and tsunamis caused damage estimated at $300 billion U.S. during 1990-1999. Although risks cannot be completely eliminated, improved forecasts made possible by integrated global ocean, climate and terrestrial observing systems will reduce the loss of life and property and help to mitigate their effects on renewable resources Source: Cheves, 2003 *fide* UNESCO, 2005.

The IEOS strategy underscores that "because no comprehensive and integrated strategy for communicating all the current data exists, *enhanced data management* is highlighted as both an overarching need and a critical first near-term action." Effective data integration is essential: e.g., a common analysis framework to integrate atmospheric, terrestrial, and oceanic data obtained from both *in situ* and space-based assets. A common data processing, archiving, and access protocol is required to achieve effective integration of data. In addition, the capacity for user-friendly, automated and remote sensing must be established. Finally, there is a necessity to establish an intergovernmental coordination and technical support mechanism to enable data integration – the core of an integrated global coastal observing system. It is also important to recognize that if operational monitoring is to happen on a global scale, there must be efforts to build capacity in all coastal countries, particularly in developing nations. Education and training, knowledge and technology transfer, and capacity building need to be enhanced to address this need.

Without implementation of a comprehensive, interoperable, multi-purpose ocean observing system to provide routine, continuous, reliable data and information, the international community will not be able to realize the nine societal benefits that comprise the benefits of the Global Earth Observation System of Systems that the President endorsed in the Ocean Action Plan: improve weather forecasting; reduce loss of life and property from disasters; protect and monitor our ocean resources; understand, assess, predict

mitigate and adapt to climate variability and change; support sustainable agriculture and forestry, and combat land degradation; understand the effect of environmental factors on human health and well-being; develop the capacity to make ecologicl forecasts; protect and monitor water resources; and monitor and manage energy resources.

Objectives

- Increase national and global access to coastal and ocean observation capabilities.
- Increase the spatial and temporal coverage of multi-purpose coastal observing platforms in the Caribbean and Pacific, in particular to support biological, sea level and geodesy studies.
- Train and educate developing countries, and other previous non-users, through partnerships and capacity-building, to improve access to and effective utilization of technology, observations, and data and products to improve coastal and ocean management and decision-making.

NOS Strengths

- NOS has a long history and exceptional expertise in coastal and ocean monitoring and observation.
- NOS makes significant contributions to the Global Earth Observing System of Systems (GEOSS) through its ocean and coastal monitoring assets, as well as through its management of the data acquired by these assets, including 28 monitoring and observation systems, some dating back as far as 1807.
- NOAA is the lead Federal agency for the Integrated Ocean Observing System (IOOS), which is the ocean component of the U.S. Integrated Earth Observation System (IEOS) and is our nation's contribution to the Global Ocean Observing System (GOOS), the ocean contribution to the Global Earth Observation System of Systems (GEOSS). NOS is the host agency to NOAA's IOOS Program.
- NOAA's IOOS Program is currently undertaking the development of an integrated data management framework that is supportive of the priorities laid out by IGOS.

ACTIONS

NOS will inform and support better decision-making for coastal and ocean management through improved access to coordinated, comprehensive, and sustained earth observations and information.

- Advance international understanding and application of NOS integrated data products and services, in particular V-Datum.
- Increase the spatial and temporal coverage of multi-purpose coastal observing platforms in the Caribbean and Pacific, in particular to support biological, sea level and geodesy studies.

Improve and Maintain the Viability of Marine and Coastal Ecosystems

Problem

Human activities continue to degrade the viability and integrity of marine and coastal ecosystems around the world, resulting in serious ecological, social, and economic consequences at local to global levels. This degradation reduces the ability of coastal and ocean ecosystems to provide the valuable products and services on which U.S. and global communities depend. It also reduces the resilience of these ecosystems, i.e., their ability to resist and recover from human and natural stressors, further increasing the costs and challenges to communities and resource managers. Much of this degradation is driven by human population growth, which is especially concentrated in coastal areas, and thus increases demand for and dependency on ocean and coastal resources. The condition of goods and services provided by U.S. marine and coastal ecosystems are closely linked and influenced by what happens in areas outside U.S. jurisdiction, making international engagement a necessary and key part of improving and maintaining the viability of U.S. and other coastal ecosystems.

"In 2000, 6 coastal megacities (with more than 10 million people) were located in East Asia; this is predicted to increase to 8 by 2015. With urbanization and the continued rural-to-urban migration, the populations of smaller coastal cities (3-8 million people) are also increasing." Source: PEMSEA, 2003.

Analysis of more than 3,000 watersheds across the Caribbean region identified 20 percent of coral reefs at high threat and about 15 percent at medium threat from damage caused by increased sediment and pollution from agricultural lands and other land modification. Source: Burke and Maidens, 2004.

Among the most serious impacts on the world's ocean and coastal resources are destruction of valuable coastal and ocean habitats, over-use and depletion of living marine resources, decreases in water quality from discharges and non-point source pollution, and increasing conflicts among uses of coastal and ocean areas. Most impacts result from a combination of factors such as the lack of information, technical capacity, institutional frameworks, social and economic incentives, and other resources that could be used for effective management of negative human impacts. These activities often crisscross jurisdictional lines and national boundaries, so addressing them requires developing and implementing solutions among international partners at a variety of scales (local, regional, national, and international). This is particularly important where resources are shared between U.S. and other countries. Such resources might be migratory species (e.g., humpback whales migrating between the U.S. and the Dominican Republic, birds migrating between Canada and Mexico along the U.S. West Coast) or important habitats or processes (e.g., Gulf of Maine, the Big Eddy in the Pacific Northwest). Key scientific information and models are lacking at the international level to assess impacts of human activities and find solutions to better manage coastal and ocean resources. In addition, in the developing world, which is heavily reliant on these resources for sustenance, there is limited internal capacity to cope with these problems.

As a leader in understanding and managing ocean and coastal ecosystems, NOS is uniquely positioned to assist international partners in building the technical, policy, and organizational tools for effective stewardship of ocean and coastal ecosystems.

Objectives

- Build and advance U.S. and international capacity to monitor and assess health trends and conditions of ocean and coastal ecosystems to improve management efforts.

- Advance understanding of ocean and coastal ecosystems through collaborative science and modeling to improve resource management.

- Build capacity and promote exchange of technology, tools, training, information, and other resources to protect, manage, and restore ocean and coastal ecosystems.

NOS Strengths

- NOS is a national leader in conservation and restoration of marine and coastal resources and has extensive experience, tools and expertise to help address these issues in international fora. Expertise includes:
  - Characterization, monitoring, and assessment of ocean and coastal ecosystems.
  - Research, monitoring, modeling, and forecasts of the impacts of human stressors on ocean and coastal ecosystems.
  - Design and implementation of coastal management programs.
  - Design and implementation of tools for habitat management.
  - Design and implementation of integrated water resource management plans.
  - Design and management of marine protected areas.
  - Design and implementation of tools for coastal habitat restoration.

- NOS leadership and participation in international organizations and partnerships, such as the UNEP Caribbean Environment Programme and International Coral Reef Initiative, helps to leverage resources and international capabilities for ecosystem-based management.

ACTIONS

NOS will strengthen U.S. and international capacity for stewardship of ocean and coastal ecosystems through international partnerships to develop, exchange, and implement:

- Scientific results.
- Data and information.
- Products and services.
- Best management practices with international partners.

- Develop and exchange U.S. best practices to improve ecosystem-based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally.
- Develop and exchange modeling and predictive capabilities to enhance ecosystem-based approaches to management by understanding and managing the impacts of contaminants, diseases, and nutrient enrichment, with special emphasis on harmful algal blooms.
- Develop specific regional initiatives to reduce key threats and build resilient marine and coastal ecosystems including a "Resilient Caribbean Ecosystems and Communities" initiative that integrates NOS/NOAA delivery of products and best management practices in this and other priority target regions.

Mitigate and Adapt to Impacts of Climate Change and Variability

Problem

Globally, climate change and variability are increasingly impacting coastal communities. Coastal zones are particularly vulnerable to climate change because they are affected by changes in both the marine and terrestrial environments. This is especially challenging to coastal managers in charge of developing appropriate adaptive responses. Traditional coastal management governance structures are often ill equipped to address the increased risks and vulnerability in coastal margins associated with climate change. It is difficult to formulate adaptive strategies due to cumulative impacts and the need to respond to coastal risk and maintain resilience of coastal communities. Our ability to conduct place-based specific response to climate change is further challenged by our lack of understanding of the political and socioeconomic context at the local, state, national, and international levels.

The impact of sea level rise from global warming could be catastrophic for many developing countries – the World Bank estimates that even a one meter rise would turn at least 54 million people in the developing world into environmental refugees. Source: World Bank, 2007.

"The temperature sensitivity of corals, and the likely limitation in their rate of acclimatization and adaptation, suggest that coral reefs are likely to have less live coral cover and lower biodiversity as a result of a warming climate." Source: Marshall and Shuttenberg, 2006.

Most countries are examining the effectiveness of their current policies and decision-making frameworks in responding to coastal risk and impacts due to climate change. NOS is uniquely placed to provide best adaptive management practices and approaches for coastal management and response.

Objectives

- Develop and improve tools and technologies to better understand and adapt to the impacts of climate change by assisting and exchanging capabilities with key international partners.
- Transfer NOAA tools and information to better understand and develop adaptation strategies to address the impacts of climate change.
- Provide technical assistance to international partners especially to coastal decision-makers and vulnerable communities.

NOS Strengths

- NOS has a suite of programs that can help mobilize coastal management decision makers in developing adaptation responses to address the impacts of climate change. NOS has a long-term observational component for relative mean sea-level monitoring for the U.S that is integrated with the NOAA Climate Program Office Climate Observing System goals and objectives.
- NOS can play a leadership role in providing information that can be used to evaluate the vulnerability of human and natural coastal systems.
- NOS can make a significant contribution by providing information and tools to support better informed decision-making and promote coastal resilient communities.

ACTIONS

NOS will promote integration of information concerning climate science to build domestic and international capacity that can support effective policy and decision-making to mitigate and adapt to impacts of climate change and variability.

- Develop and share tools to understand ecosystem resilience to climate variability and change and their impacts on coastal communities, including ocean acidification, sea level rise, and coral bleaching prediction.

- Develop and share tools for adaptive management working with the coastal management and MPA communities, in particular in the Caribbean and Pacific.

Reduce Vulnerability to Natural and Anthropogenic Hazards

Problem

Over the last decade, disasters triggered by physical or biological natural hazards have claimed more than 600,000 lives and affected more than 2.4 billion people world-wide, the majority in developing countries. In addition, anthropogenic hazards such as oil spills can cause significant damage to ocean and coastal ecosystems, and disrupt commercial and recreational marine activity. Now more than ever, the international community must accelerate its efforts to reduce global vulnerability to natural and anthropogenic hazards. However, coastal communities are lacking critical resources and expertise to educate, plan, prepare for, respond to, and mitigate the negative impacts of hazards that threaten their existence.

While prevention, preparedness, and mitigation strategies have been applied on a large scale in the developed world, these resilience measures have not been adequate. Developing countries, particularly those in regions facing multiple hazards, confront an even larger challenge, since they do not possess the same resources and planning tools as the developed world. Often in many nations, sufficient resources, tools, data, and information are not available to the appropriate decision makers. Moreover, the importance of hazard mitigation is often not clear to policymakers or the general population. In addition, training, education and communications gaps that exist in these areas hinder or prevent information sharing critical to building hazard resilient coastal communities.

While hazards are inevitable, and the elimination of all risk is impossible, there are many technical measures, traditional practices, and public experience that can reduce the extent or severity of economic and social disasters. Hazards and emergency requirements are a part of living with nature, but human behavior can be changed. Source: IDNDR Programme Forum, 1999.

"We must, above all, shift from a culture of reaction to a culture of prevention. Prevention is not only more humane than cure; it is also much cheaper... Above all, let us not forget that disaster prevention is a moral imperative, no less than reducing the risks of war" *Kofi A. Annan* . Source: IDNDR, 1999.

Objectives

- Engage and collaborate with our international partners to increase the international capability at the regional scale to prevent, prepare for, respond to, and mitigate negative impacts of physical and biological natural hazards to coastal ecosystems.

- Engage and collaborate with our international partners to create regional plans for increasing international capabilities to prevent, prepare for and respond to anthropogenic hazards in coastal ecosystems, such as oil and chemical spills, ship groundings, land-based pollution, and over-fishing.

NOS Strengths

- Provide essential scientific information, tools, technical capability and expertise needed for effective and better-informed coastal resource management, as well as a framework for national policy leadership.

- Support effective management, sound science, and exchange of information and tools to preserve, sustain and restore valuable coastal ecosystems such as coral reefs, mangrove forests, and wetlands that mitigate damage from coastal storms and pollution.

- Collect, analyze, and distribute historical and real-time observations and predictions of water levels, coastal currents, and other meteorological, biological, and oceanographic data to help protect life and property, and support economic growth, and protect the environment. The NOS water level observation capability is integrated with NOAA's goals and objectives for tsunami warning systems.

- Support coastal hazard mitigation and planning activities at the local and state levels.

- Serve as a focal point for spill preparedness, hazardous waste site investigation, environmental damage and restoration, as well as marine debris prevention and removal.

- Define, maintain, and manage NOAA's National Spatial Reference System, nautical charting, hydrographic surveying, and other related geospatial activities, thus continuing as a world leader in the conduct, development, training, and promotion of the standards necessary to protect life, property, economic growth, and the environment.

ACTIONS

NOS will reduce vulnerability to natural and anthropogenic hazards through building international capacity in order to understand, forecast, prepare for, respond and adapt to hazards.

- Develop NOAA international marine debris strategy.

- Share NOS tools and methodologies in hazard prediction, preparedness, mitigation and response with priority regions and countries.

Promote Safe and Environmentally Sound Navigation

Problem

The rapid expansion of marine transportation and changes in shipping technologies pose a key challenge to governments in the development and application of global transportation standards, products, and services.

"Some 50,000 ship movements carrying as much as one quarter of the world's commerce and half the world's oil pass through the Straits of Malacca and Singapore each year" Source: IMO, 2007.

In the first half of 2006, US containerized imports from Asia increased by 13.2 percent over the same period in 2005. Source: DPI, 2006.

Every year, the Marine Transportation System (MTS) moves $10 trillion tons of cargo and 95 percent of U.S. international trade. In the last 50 years, ships have doubled in length, width, and depth. When transiting a channel, ships may have only inches between their hulls and the channel bottom, or their masts and the bridges above. The potential for serious injury to lives, property, and the environment is compounded by the fact that over half the cargo transported by ships is oil or other hazardous material. By 2020, international maritime trade is expected to double – or even triple – which forecasts tough challenges ahead for the MTS. A major challenge facing the nation is to improve the economic efficiency and competitiveness of U.S. maritime commerce, while reducing risks to life, property, and the coastal environment. With increased marine commerce comes an increased risk to the coastal environment, making maritime navigation safety a serious national and international concern.

New global standards will place new demands on countries to implement these standards: (a) the International Maritime Organization may require mandatory carriage of an Electronic Chart Display and Information System (ECDIS) on SOLAS class vessels, which increases the need for development of worldwide Electronic Navigational Charts (ENC) coverage in the next few years; (b) there will be increased demand for decision-support systems that measure and disseminate observations and predictions of water levels, currents, salinity, and meteorological parameters (e.g., winds, atmospheric pressure, air and water temperatures) that mariners need to navigate safely; and (c) international standard geodetic reference frame will require countries to conduct the reconnaissance, technical guidance, and training necessary to be able to develop highly accurate, contemporary spatial reference systems. Moreover, products and services developed through global hydrographic, geodetic and physical oceanographic standards applications need to be made accessible to diverse social and industrial sectors to serve integrated environmental management needs.

Increased development of international standards and acquisition of data is necessary for mitigation of damage to the environment due to climate change and other natural and anthropogenic hazards as well as human development. Many countries lack the capability to conduct the geodetic, hydrographic and tidal surveys necessary to produce accurate charts of the critical maritime, surface and air routes and ports within their territorial boundaries. They also lack the capabilities to integrate these data into decision-support tools thus resulting in possibly hazardous conditions for transiting ships, planes, and surface transportation.

Objectives

- Participate and lead within international fora to ensure that standards and policies are consistent with U.S. interests.

- Support international collaborative capacity-building efforts to mutually improve geodetic, hydrographic, and tidal capabilities in interested countries, including Guatemala, Honduras, Mexico, Korea, Canada, and Suriname.

- Increase inclusion of a hydrographic and geodetic component in environmental projects funded by international donor organizations, particularly in Latin America and the Caribbean Sea region.

Strengths

- NOS is a national leader in ensuring safe, efficient, and environmentally-sound maritime commerce in and out of our Nation's ports by producing necessary navigational products and ensuring the development and implementation of global standards (hydrographic, cartographic, geodetic, and physical oceanographic) for these products and services.

- NOS participates in international organizations (e.g., the International Hydrographic Organization (IHO), International Federation of Surveyors (FIG), the International Association of Geodesy (IAG), regional geodetic, hydrographic and tidal commissions, committees, associations, and working groups and collaborates with other national hydrographic and geodetic offices where we keep abreast of and provide leadership in the development of the latest technologies.

- Through leadership in international organizations, NOS assists developing countries of the world with the production and use of products necessary for safe, efficient, and environmentally-sound maritime transportation.

- Important partnerships have been established through the United Nations (IMO), scientific (FIG), intergovernmental (IHO, Group on Earth Observation), and bilateral relationships (Korea, Mexico, Brazil, Canada, U.K. and Gulf of Honduras) to support international standards development and to build regional capacity to implement those standards.

ACTIONS

NOS will promote safe and environmentally sound navigation of goods and people through the development and implementation of global hydrographic, geodetic, physical oceanographic and environmental standards.

- Facilitate improvement of wider Caribbean and Latin American regional hydrographic and cartographic capacity by collaborating in activities that demonstrate the importance of hydrographic information for safe navigation, protection of the marine environment, and sustainable economic growth.

- Integrate environmental, navigation, and geospatial information in marine and coastal management, navigation policy, maritime infrastructure development, and management tools.

Table 2. Priority Actions to Implement the Five NOS International Strategy Goals

NOS International Strategy Goals	Actions to Implement the Goal
Observe and Predict the Earth System	• Advance international understanding and application of NOS integrated data products and services, in particular V-Datum. • Increase the spatial and temporal coverage of multi-purpose coastal observing platforms in the Caribbean and Pacific, in particular to support biological, sea level and geodesy studies.
Improve and Maintain the Viability of Marine and Coastal Ecosystems	• Develop and exchange U.S. best practices to improve ecosystem-based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally. • Develop and exchange modeling and predictive capabilities to enhance ecosystem-based approaches to management by understanding and managing the impacts of contaminants, diseases, and nutrient enrichment, with special emphasis on harmful algal blooms. • Develop specific regional initiatives to reduce key threats and build resilient marine and coastal ecosystems including a "Resilient Caribbean Ecosystems and Communities" initiative that integrates NOS/NOAA delivery of products and best management practices in this and other priority target regions.
Mitigate and Adapt to Impacts of Climate Change and Vulnerability	• Develop and share tools to understand ecosystem resilience to climate variability and change and their impacts on coastal communities, including ocean acidification, sea level rise, and coral bleaching prediction. • Develop and share tools for adaptive management working with the coastal management and MPA communities, in particular in the Caribbean and Pacific.
Reduce Vulnerability to Natural and Anthropogenic Hazards	• Develop NOAA international marine debris strategy. • Share NOS tools and methodologies in hazard prediction, preparedness, mitigation and response with priority regions and countries.
Promote Safe and Environmentally Sound Navigation	• Facilitate improvement of wider Caribbean and Latin American regional hydrographic and cartographic capacity by collaborating in activities that demonstrate the importance of hydrographic information for safe navigation, protection of the marine environment, and sustainable economic growth. • Integrate environmental, navigation, and geospatial information in marine and coastal management, navigation policy, maritime infrastructure development, and management tools.

C. Benefits of Implementing the NOS International Strategy

There will be positive net benefits to the NOS by adopting a corporate approach to pursuing international work through the implementation of this International Strategy. This Strategy provides the infrastructure and direction to allow NOS Program and Staff Offices to more effectively respond to NOAA leadership in identifying and pursuing high value and high impact international engagements. Currently, only a small portion of current NOS international activities are coordinated across NOS. While some of these activities may be unique to only one Program or Staff Office, there are opportunities for NOS Offices to collaborate internationally, thus increasing the impact of NOS programs.

The NOS International Operational Framework created the NOS International Coordination Council (NICC) to improve agency planning and program execution by providing a venue for NOS Program and Staff Offices to deliberate and identify opportunities for NOAA and NOS leadership to provide U.S. global leadership. Higher impact initiatives could be developed from improved deliberation and planning to build valuable new external partnerships and access resources to accomplish NOS's goal to be a global leader in the integrated management of the oceans and coasts.

The benefits of implementing this Strategy are summarized in Table 3, based upon the program evaluation criteria adopted in the NOS International Operational Framework.

Table 3. Benefits of Implementing the International Strategy

Evaluation Criteria	Benefits
Policy and Planning: Fulfill U.S. obligations	• Increased coordination and communication through the Strategy will help NOS increase its capacity to address NOS international crosscutting priorities, enhance NOS/NOAA contributions to bilateral and other international agreements, and strengthen NOS representation to international agreements, agencies, and partnerships.
Program Execution: Enhance efficiency and effectiveness of program execution	• Better coordination of NOS' international engagements through the Strategy will have a positive impact on efficiency, enhanced benefits from NOS international integrated engagements, and leveraging international expertise.
Funding: Access to resources to achieve NOS international priorities	• Improved NOS integration of its products and services internationally may assist in leveraging external resources. • Implementation of the Strategy will have an overall positive impact on raising external resources, streamlining administrative overhead, and enhancing programmatic resources to pursue international work. However, it is recognized that there will be an impact on administration of international work reflected both in NICC membership staff time and growth of high profile international work.
Impacts/Benefits: Enhance NOS's global leadership	• The Executive Leadership Team (ELT) and NOAA International Affairs Council (IAC) will be better informed on NOS' international activities and will have a greater capability to present a one NOS/NOAA identity to the global community as a result of implementing this Strategy. In addition, NOS can make more visible and effective contributions to addressing priorities of the Ocean Action Plan and U.S. foreign policy goals in key areas.

II. Translating Priorities into Action

The five NOS coastal resilience goals provide the framework to organize and coordinate design and execution of a new NOS International Program through annual action plans. The five strategic goals represent a full spectrum of capabilities and expertise distributed throughout NOS. Within this framework, and evaluated against program criteria, existing mandates, obligations, and existing capabilities, NOS will lead a measured, comprehensive engagement internationally to improve operational capacity for our own programs as well as for others to build more resilient coastal communities within a variety of societal and cultural contexts.

This Strategy, informed by NOS' strategic mandates outlined in Appendix I, will guide and structure the development of NOS' international annual action plans. Particular emphasis is placed on identifying areas where two or more NOS program offices (and relevant NOAA Line Offices) can mobilize complementary capabilities to demonstrate the merits of an integrated approach to capacity building for coastal resilience.

This Strategy also recognizes NOS' and NOAA's multipurpose capabilities are a critical foundation to realizing the coastal resilience goals. For example, observing systems provide the data to support the vision of GEOSS, much of which is critical to initiate regional and global ocean circulation models that drive sub-regional or local climate change models while also providing the operational forecasts of ocean currents useful for defining shipping lanes or determining hurricane landfall or hazardous spill dispersal and threats to critical resources. The data collected about the status and trends of biological productivity of the oceans is a critical reference for coastal managers and stakeholders in promoting greater environmental literacy among the citizenry which helps realize an ecosystem approach to management. Conservation of critical habitats requires addressing near term threats from land-based sources of pollution or coastal development, and also an understanding of the more gradual and systemic stresses from long-term sea level rise or sea surface temperature trends. Promoting institutional and international partnerships across sectors and communities, therefore, is a fundamental element to the NOS strategy.

A. Implementation Plan

The Implementation Plan will guide execution of specific international activities over the FY2007 – FY2011 time frame identified during the development of the NOS International Strategy. The Strategy and Implementation Plan will increase cross-NOS collaboration of international activities and build on the synergies among NOS programs to achieve a higher global impact. This Plan is a flexible, five-year implementation schedule and is a representative, but not comprehensive description of NOS international engagement during this period. Annual NOS International Action Plans will elaborate more thoroughly on these activities, providing details on how they will be executed, resources required, and their link to NOAA and NOS missions.

The NICC identified the Caribbean and Pacific as priority regions to focus NOS international work. Activities listed in the early years of the Plan (FY2007 - FY2008) are underway and/or have existing funds for implementation. To execute activities listed in out-years, the NICC will attract partnerships and internal/external funding and expertise to develop a more comprehensive and better-coordinated NOS international program. The Implementation Plan is intended to be a living document that can be modified to adjust for new political realities, funding changes, and other external factors NOS will face in the years ahead.

The Implementation Plan is presented in Appendix III.

B. Developing the International Annual Action Plan

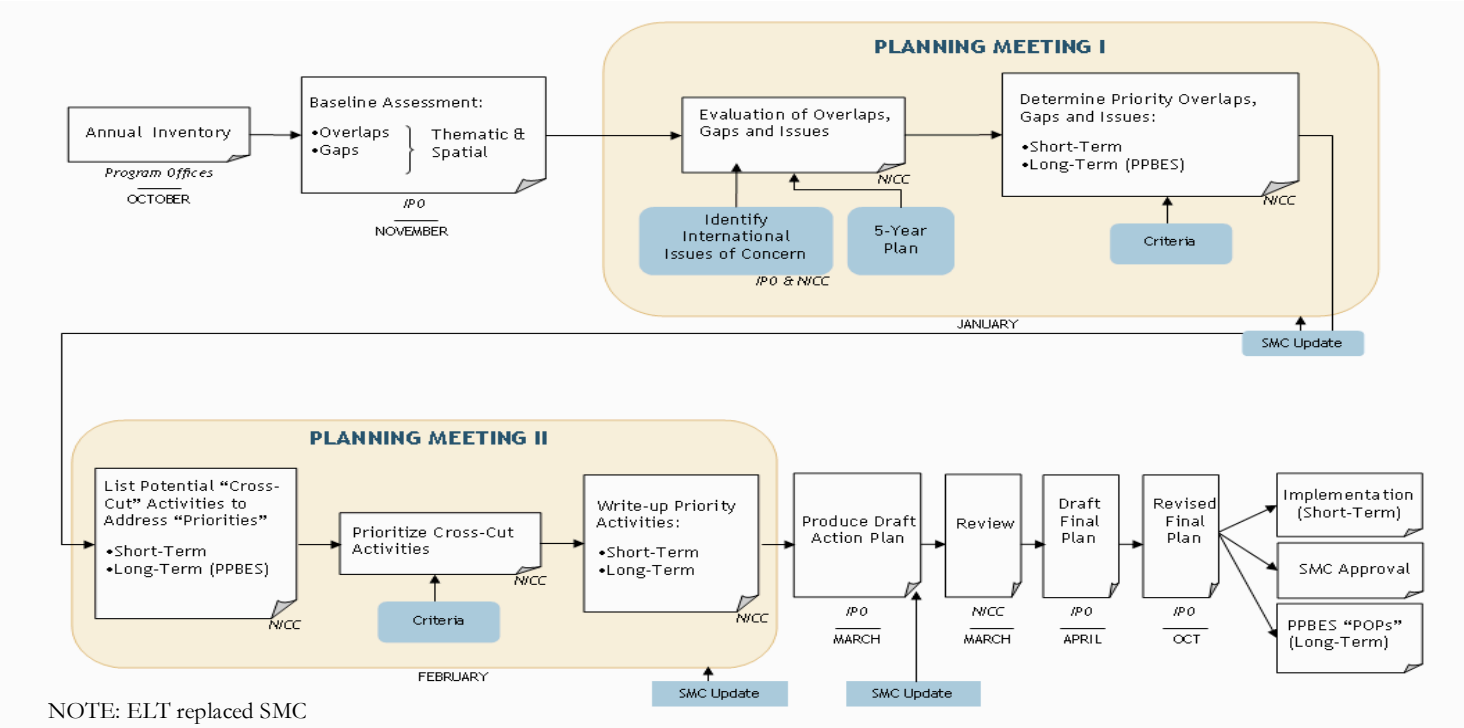
The Annual Action Plan will be delivered during the second quarter of each fiscal year (January to March) in light of annual appropriations and will cover a specific implementation interval of October-September. The Plan will identify actions, milestones and performance tracking and evaluation criteria. Actions identified should contain an element of integration among NOS and NOAA capabilities or have particular visibility and significance to NOAA leadership.

For each of NOS's five current strategic goals, international objectives, and actions were identified by the NOS International Coordination Council. In considering ongoing, developing, or important new actions in the next five years, NOS applied international criteria adopted in the NOS International Operational Framework (January 2007), such as existence of established key internal and external partnerships, technical and financial resource capacity, support to U.S. Government and NOAA priorities, and others. A suite of actions (Table 2) were identified based upon the current capacity and immediate opportunities for execution in the 2007-2011 period.

In addition to current year execution plans, new or important future engagements and required programmatic, technical, and funding partnerships will be identified in support of the annual action planning cycle. Each year's Annual Action Plan will also provide an important reference point for identifying NOS' *emerging* priority interests for input to the NOAA Program Planning, Budgeting and Execution System (PPBES) process in the five year planning horizon. The Annual Action Plan will be developed to address opportunities for cross-goal team/NOAA matrix program initiatives.

The NOS International Operational Framework outlined an annual planning process for developing Action Plans. See Figure 1 below.

Figure 1. Timetable for Developing Action Plans



NOTE: ELT replaced SMC

C. Developing Resources for NOS International Priorities

Capacity building for enhanced coastal resiliency necessarily involves close partnerships among partners and stakeholders. As such, resources for pursuing NOS international programs generally reflect a variety of internal and/or external partners, including such sources as NOAA discretionary funds, NOAA Coral International Grant Program, foreign governments, agencies of the United Nations (including UN Development Programme, UN Environmental Programme, the Intergovernmental Oceanographic Commission, and others), U.S. Department of State, the World Bank, foundations, and universities and research institutions. Partnerships are often dynamic, which underscores the requirement for broad-based partnerships in NOS' approach to international cooperation.

D. Measuring Outcomes and Performance

The International Annual Action Plan will identify actions and milestones to implement the goals and objectives identified in the coastal resiliency framework. Performance indicators will be identified to evaluate progress in executing the International Annual Action Plan.

The NOS International Annual Action Plan will define performance measures that assess the achievement of the following outcomes:

- Improved access to coordinated, comprehensive, and sustained earth observations and information in GEOSS to inform and support decision-making for coastal and ocean management issues.
- Enhanced U.S. and international capacity for ecosystem-based management through exchange of scientific information and best management practices.
- Enhanced integration of information concerning climate science to build domestic and international capacity that can support effective policy and decision-making to adapt to climate change and variability.
- Improved capabilities to understand, forecast, prepare for, respond and adapt to natural and anthropogenic hazards.
- Expanded development and implementation of global hydrographic, geodetic and physical oceanographic standards to promote safe and environmentally sound navigation.
- Demonstrated NOS leadership in addressing priorities of the U.S. Commission on Ocean Policy, the U.S. Ocean Action Plan, and other relevant governmental assessments.

III. The NOS Current International Activities and Coastal Resilience

A. Existing Partnerships and Regional Engagements Provide Strong Platform for Coastal Resilience

The NOS coastal resilience goals provide a new framework to further integrate NOS international capabilities and existing international activities. Existing international partnerships and agreements can be mobilized to support resilience approaches in regions such as the Americas and the Pacific, where NOS already has extensive collaboration, local partners, and experience. NOS capabilities can be coordinated to improve integrated delivery of NOS products and services across the five coastal resilience goals.

Partners: NOS has an extensive suite of international partners with whom it shares the goals of advancing the understanding of the marine and coastal ecosystems to enhance sustainable development. These partnerships are based on more than 25 active NOS international agreements, and NOS mandates (see Appendix 1) as well as numerous informal arrangements. Through this network, NOS has created invaluable partnerships to ensure it remains a global leader in coastal and ocean policy, management, and science. The partnerships provide our managers and scientists with access to decision-makers, scientists, and managers worldwide allowing us to exchange information and build common understanding with peers worldwide. Our partnerships involve intergovernmental organizations, non-governmental professional associations, foreign governments, private organizations, universities, and research institutions. NOS gains valuable insights and information through these exchanges that advance our domestic capabilities to achieve our mission more effectively in the U.S.

Regions: In considering NOS' current global investment profile, mandates and existing international agreements and priorities, NOS engagement is most prominent in two regions: the America's (especially the Wider Caribbean) and the Asia-Pacific region (especially Micronesia and East Asia). In these two regions, there is potentially a substantial benefit to be gained from an integrated approach in the 2007-2011 period. This is further reflected in U.S. membership and NOS leading participation in regional bodies of such global intergovernmental organizations as the IHO, UNEP, IOC. The importance of these two regions is further underscored by their proximity to the U.S. (and hence immediate potential impact on U.S. coastal waters), their biological diversity and richness (Caribbean and South East Asia), and their growing global significance (especially East Asia) in terms of maritime trade patterns, coastal population growth including intensive coastal tourism development, and global and regional anthropogenic threats.

However, NOS recognizes and fully values its critically important engagements in other regions of the world (such as Europe) that are fundamental to advancing the field of marine science. There are also important engagements emerging as a result of new partnerships that will continue to develop, for example with the U.S. Department of State in North Africa on integrated watershed management. Additionally, NOS has an ongoing commitment and a great stake in maintaining its leadership role in global fora through the development of standards, protocols, and policies. These fora include the United Nations Development Program, United Nations Environment Programme, Intergovernmental Oceanographic Commission, World Meteorological Organization, Intergovernmental Hydrographic Commission, Intergovernmental Maritime Organization, and International Federation of Surveyors, and others.

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Appendix I. Drivers and Authorities for NOS International Activities

Overarching Drivers/Authorities

U.S. Ocean Action Plan	Support implementation of the international components of the President's U.S. Ocean Action Plan
Secretarial Level Priorities (2006)	Support the highest level Departmental policy priorities espoused by the Secretary of Commerce
Departmental Organization Order 25-5 (Section 6. NOS)	Act as focal point for participation in international oceanographic, hydrographic, and coastal management activities, including, in part, the international exchange of data, services, products and forecasts; and coordination and cooperation with the Intergovernmental Oceanographic Commission, the International Hydrographic Organization, and other bodies designated by the Under Secretary/Administrator
15 U.S.C. Section 1525	Authorizes the Secretary to prepare special studies on matters within the authority of the Department of Commerce, including joint projects with nonprofit organizations, research organizations, or public organizations or agencies; the cost of any such projects are to be apportioned equitably as determined by the Secretary
NOAA Strategic Plan	Exercise international leadership as one of five cross-cutting priorities
NOS Strategic Plan	Demonstrate global leadership in the integrated management of the oceans. Build NOS preeminence in ocean science, ocean management, and ocean policy formulation
PPBES Goal and Program Operating Plans	Support a wide array of international activities across NOS Program Offices and IPO

Climate Drivers/Authorities

Agreement between NOS and the Secretariat of the Caribbean Community for Technical Cooperation in Resource Management and Development (2003)	Provides technical support to CARICOM countries to build capacity to respond to impacts of climate change and vulnerabilities and facilitates development of adaptation interventions and strategies (NOAA)
National Climate Program Act of 1978, 15 U.S.C. § 2901 et seq	Establish a national climate program including data collection, research, forecasting, and dissemination. 1,3
Global Change Research Act of 1990, 15 U.S.C. § 2921 et seq	Develop a comprehensive U.S. research program to assist the Nation and the world in understanding, assessing, predicting, and responding to human-induced and natural processes of climate variability and global change. 1,3

Ecosystem Drivers/Authorities

Coral Reef Executive Order	Encourage Federal agencies to implement strategies and actions to promote conservation and sustainable use of coral reef resources worldwide
Coral Reef Conservation Act of 2000 (P.L. 106-562 Title II), 16 U.S.C. Section 6401 et seq)	Authorizes the Secretary of Commerce to conduct activities to conserve coral reefs and coral reef ecosystems which include (16 USC § 6406(b)(4)) cooperative conservation and management of coral reefs and coral reef ecosystems with local, regional, or international programs and partners The Coral Reef Conservation Act (CRCA) calls for the development of a National Coral Reef Action Strategy which includes a section on international and regional issues and priority needs; establishes a grant program for coral reef conservation projects for which a portion be made available for (16 USC Section 6403 (d)(3)) projects that address emerging priorities or threats, including international priorities or threats; creates a Coral Reef Conservation Fund to support partnerships between public and private sectors to further coral reef conservation
The Coastal Zone Management Act (CZMA) 16 U.S.C. Section 1451 et seq., especially section 1456c	Authorizes the Secretary of Commerce to conduct a program of technical assistance and management-oriented research appropriate to the furtherance of international cooperative efforts in coastal zone management
MPA Executive Order	Identify opportunities to improve linkages with and technical assistance to international marine protected area programs
Title III of the Marine Protection, Research and Sanctuaries Act (MPRSA), 16 U.S.C. §§ 1431-1445c1, more commonly known as the National Marine Sanctuaries Act (NMSA)	Mandates the National Marine Sanctuary Program to "cooperate with global programs encouraging conservation of marine resources" (NMSA Section 301(b)(9)) and to "cooperate with other governments and international organizations...for the protection and management of special marine areas: (NMSA Section 305(c)); Authorizes an extensive array of authorities and programs to be used in furtherance of the title, including international activities
Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. 1442(b)	Authorizes NOAA to enter into cooperative agreements with other governments and international organizations to further the purposes of the act for the protection and management of marine special areas In connection with Department of Commerce program of research with respect to the possible long-range effects of pollution, over-fishing, and man-induced changes of ocean ecosystems, the Secretary of Commerce, under the foreign policy guidance of the President and pursuant to international agreements and treaties, may act alone or in conjunction with any other nation, and shall make known the results of the activities by such channels of communications as may appear appropriate
NWHI Executive Order and Marine National Monument Proclamation	Requires the Department of State, in consultation with the Department of Commerce, to cooperate with other governments and international organizations in furtherance of the purposes of the proclamation and consistent with applicable regional and multilateral arrangements for the protection and management of special marine areas
MOU between UNEP/GPA – NOAA on implementation of the Global Programme of Action in the Wider Caribbean Region	Establish a framework for collaboration between NOAA and UNEP/GPA related to coastal and marine pollution originating from land and coastal degradation, within the Wider Caribbean region and the Americas at large; and to facilitate the establishment of a GPA Node in Washington to provide effective support to GPA related activities in the Americas at large, including those under the White Water to Blue Water Initiative (WW2BW)
U.S.-Kingdom of Morocco Science and Technology Agreement	Establishes cooperation between US agencies and ministries in Morocco. The GPA program of work is part of this action to develop coastal management programs to address nonpoint source pollution, desertification, technical exchange on IOOS and GEOSS. (2006-2011)

North American Agreement on Environmental Cooperation, Commission on Environmental Cooperation	Leads U.S. participation in the CEC-led, North American Marine Protected Areas Network which aims to enhance and strengthen the conservation of marine biodiversity in critical marine habitats throughout North America by creating functional linkages and information exchanges among existing and planned marine protected areas
U.S.-China Science and Technology Agreement (1979)	Implement the Marine and Fisheries Protocol of this Agreement (NOAA). NOS administers the Coastal Management component of this Protocol
United Nations Program on Biodiversity Management in China South Sea	Contribute to improved capacity at three marine protected areas in China
Agreement Relating to Scientific and Technical Cooperation between the Government of the United States of America and the Government of the Republic of Korea, dated November 1, 2000	Collaborate on building mutual capacity for integrated coastal and ocean resources management; Agreement between NOAA and the Republic of Korea's Ministry of Maritime Affairs and Fisheries is administered by NOS with participation of five NOAA line offices
U.S.-Japan Cooperative Program in Natural Resources	Exchange biennially scientific information under the bilateral Coastal Environmental Science and Technology Panel (CEST)
U.S.-Vietnam Science and Technology Agreement	Chairs the marine sciences working group under the Agreement and support for various projects to build capacity for integrated Coastal management in Vietnam

Hazards drivers/authorities

MOU with the International Group of Protection and Indemnity (P&I)	Promote expeditious and cost-effective restoration of injured natural resources and services resulting from ship-source oil spills in the U.S., as authorized by the Oil Pollution Act of 1990 and determined by the Natural Resource Damage Assessment regulations
NOAA Reauthorization Act, P.L. 102-567, in particular the Coastal Ocean Program (created by Section 201(c) of P.L. 102-567)	Authorizes the Coastal Ocean Program (COP) to augment and integrate existing programs of NOAA, including efforts to: (a) improve predictions of fish stocks; (b) better conserve and manage living marine resources; (c) improve predictions of coastal ocean pollution to help correct and prevent degradation of the ocean environment; (d) promote development of ocean technology to support the effort of science to understand and characterize the role oceans play in global climate and environmental analysis; and (e) improve predictions of coastal hazards to protect human life and personal property
The Oil Pollution Act of 1990 (OPA) 33 U.S.C. Section 2701 et seq., PL 101-380, as amended, Sec. 3001	Implement the Oil Pollution Act of 1990, which in foreign governments may also act as trustees for oil spills

Observations drivers/authorities

NOAA Strategic Plan and Annual Guidance Memo	One of NOAA's highest priorities for FY 2009-2013 is a "Globally integrated oceanic and atmospheric observations and data management"
The U.S. Ocean Action Plan	The U.S. Ocean Action Plan specifically designates "[building] a Global Earth Observation Network, including Integrated Ocean Observation" as an immediate and long-term action item, including "[leading] development of international capacity building effort"
Administrative Directive on IOOS	Through the IOOS Development Plan (approved by the NORLC/ICOSRMI under the Committee on Ocean Policy established by Executive Order 13366), the Administration has designated NOAA as the lead agency for the implementation and administration of IOOS.

Transportation drivers/authorities

Coast and Geodetic Survey Act of 1947 33 U.S.C. Section 883b	Authorizes the Secretary of Commerce to conduct the following activities, in order that full public benefit may be derived by the dissemination of data resulting from activities under the Coast and Geodetic Survey Act and of related data from other sources: 1) Analyze and predict tide and current data 2) Process and publish data, information, compilations, and reports
Hydrographic Services Improvement Act of 1998, (P.L. 105-384)	Directs NOAA to acquire hydrographic data, participate in the development of, and implement for the United States in cooperation with other appropriate Federal agencies, international standards for hydrographic data and hydrographic services; and internationally, ensure comprehensive geographic coverage of hydrographic services, maintain a national database of hydrographic data, and provide hydrographic services in uniform and easily accessible formats by contracting with private entities and other appropriate means
33 U.S.C. Section 883d	This section authorizes the Secretary of Commerce to conduct developmental work to increase engineering and scientific knowledge for the improvement of surveying and cartographic methods, instruments, and equipment; and to conduct investigations and research in geophysical sciences (including geodesy, oceanography, seismology, and geomagnetism)
Powers and Duties of DOC (15 U.S.C. Section 1512)	Authorizes the Department of Commerce to foster, promote, and develop foreign and domestic commerce and fishery industries of the U.S.
Boundary Waters Treaty of 1909 1950 Niagara Treaty	Exchange water level data with Canada under treaties that require regulation of operations and support of cooperative power generation; these exchanges are coordinated under the International Joint Commission (IJC), a group established by the Boundary Waters Treaty, and whose six commissioners are appointed by the President of the United Sates and the Prime Minister of Canada (Parties involved in meeting the international agreements include: several boards of control, IJC committees of two Federal agencies, eight states and two Canadian provinces)

Appendix II. Criteria for Developing NOS's Corporate International Programs

Policy and Planning	
U.S.G. Interest	• Is the activity required by international agreement or treaty to which the U.S. is/is likely to become a signatory or party? • Is the country or activity consistent with international priorities of Administration, e.g., Ocean Action Plan or Department of State?
NOAA/ NOS Interest	• Is the country or activity supportive of, or is consistent with, an NOS, NOAA, or DOC priorities and policies? • Does the activity or project directly support NOS's primary missions? • Is the activity authorized by Federal legislation or regulation? • Does the activity address a priority geographic area?
Program Execution	
	• Has the activity been incorporated into NOS's annual planning process or is it timely for introduction to the annual planning process? • Is the activity coordinated with NOS/IPO, or NOAA IA to enhance integration and awareness? • Does the activity present an opportunity to leverage expertise from two or more NOS Program Offices? • Does the activity require new tools or significant new information for successful implementation? • Does NOS have appropriate expertise? If not, are there other U.S. or regional experts available or needed to perform this function? • Have language and communication (international coordination) issues been mitigated? • Is the proposed activity consistent with the Economy Act and other legislative requirements?
Funding	
	• Is the NOS share of cost appropriate? • Do existing resources have to be reprogrammed to accomplish the activity? • Are there partner resources available to support the project until completion?
Impacts/Benefits	
	• Does it advance pertinent management, education, technology, or scientific knowledge or practice in the U.S. and/or abroad? • Does the task directly advance domestic program success? • Is the activity an opportunity to enhance the professional experience of NOS employees? • Is there a capacity building element such that recipients are better able to manage people or resources, consistent with U.S and NOAA goals, when NOS engagement ends? • If the request is training, does it have a "train the trainer's" component?

Appendix III. Implementation Plan

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Observe and Predict the Earth System	**Advance international understanding and application of NOS integrated data products and services, in particular V-Datum**	Pacific	Realign US-Japan "CEST" program to meet NOS program interests in observations				
		Pacific	Develop, provide training and assistance for reef monitoring/ assessment to enhance the Global Coral Reef Monitoring Network				
		Caribbean & Pacific		Provide training and assistance for reef monitoring/ assessment to enhance the Global Coral Reef Monitoring Network	Provide training and assistance for reef monitoring/ assessment to enhance the Global Coral Reef Monitoring Network	Provide training and assistance for reef monitoring/ assessment to enhance the Global Coral Reef Monitoring Network	Provide training and assistance for reef monitoring/ assessment to enhance the Global Coral Reef Monitoring Network
		Global	Exchange expertise between NOAA/IFREMER for ecosystem mgmt.	Exchange expertise between NOAA/IFREMER for ecosystem mgmt.	Exchange expertise between NOAA/IFREMER for ecosystem mgmt.	Exchange expertise between NOAA/IFREMER for ecosystem mgmt.	Exchange expertise between NOAA/IFREMER for ecosystem mgmt.
		Global	Align bilateral programs to implement GEOSS goals (Korea, China, Japan, Europe, etc.)	Align bilateral programs to implement GEOSS goals (Korea, China, Japan, Europe, etc.)			

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Observe and Predict the Earth System (cont.)	**Increase the spatial and temporal coverage of multi-purpose coastal observing platforms in the Caribbean and Pacific, in particular to fulfill support of biological, sea level and geodesy**	Caribbean	Expand and implement multi-purpose observing platforms in Caribbean to address natural and anthropogenic hazards management, e.g. GLOSS, Tsunami, PORTS, CORS	Expand multi-purpose observing platforms in Caribbean to address natural and anthropogenic hazards management, e.g. GLOSS, Tsunami, PORTS, CORS	Expand multi-purpose observing platforms in Caribbean to address natural and anthropogenic hazards management, e.g., GLOSS, Tsunami, PORTS, CORS	Expand multi-purpose observing platforms in Caribbean to address natural and anthropogenic hazards management, e.g., GLOSS, Tsunami, PORTS, CORS	Expand multi-purpose observing platforms in Caribbean to address natural and anthropogenic hazards management, e.g., GLOSS, Tsunami, PORTS, CORS
Improve and Maintain the viability of Marine and Coastal Ecosystems	**Develop and Exchange US best practices to improve ecosystem based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally**	Pacific	Coordinate MPA Capacity Building Training for South China Seas (5 training sessions) and Eastern Tropical Pacific Seascape (1 training session) Identify opportunities to link ICM and MPA capacity building with climate change	Coordinate MPA Capacity Building Training for Eastern Tropical Pacific Seascape (1 training session), South China Seas (2 trainings) and consider initiating program in new location (TBD but most likely focused in South Pacific around the FBNMS and Western Indian Ocean) Identify opportunities to link ICM and MPA capacity building with climate change	Coordinate MPA Capacity Building Training in South Pacific (or other areas as determined) Identify opportunities to link ICM and MPA capacity building with climate change	Coordinate MPA Capacity Building Training in South Pacific (or other area as determined) and consider initiating program in new location (TBD but most likely focused in Africa or Tropical Pacific) Identify opportunities to link ICM and MPA capacity building with climate change	Coordinate MPA Capacity Building Training in predetermined locations. Identify opportunities to link ICM and MPA capacity building with climate change
		Caribbean & Pacific	Provide training and grants to strengthen the use and effectiveness of coral reef protected areas and protected area networks	Provide training and grants to strengthen the use and effectiveness of coral reef protected areas and protected area networks	Provide training and grants to strengthen the use and effectiveness of coral reef protected areas and protected area networks	Provide training and grants to strengthen the use and effectiveness of coral reef protected areas and protected area networks	Provide training and grants to strengthen the use and effectiveness of coral reef protected areas and protected area networks

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Improve and Maintain the viability of Marine and Coastal Ecosystems (cont.)	**Develop and Exchange US best practices to improve ecosystem based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally (cont.)**	Caribbean & Pacific	Initiate a technical assistance program with selected countries in the wider Caribbean Region (SIDs/Central America); Pacific (Vietnam, Korea, China) to provide assistance in development and implementation of integrated Watershed Resource Management Programs to reduce nutrient loading	Initiate a technical assistance program with selected countries in the wider Caribbean Region (SIDs/Central America); Pacific (Vietnam, Korea, China) to provide assistance in development and implementation of integrated Watershed Resource Management Programs to reduce nutrient loading	Initiate a technical assistance program with selected countries in the wider Caribbean Region (SIDs/Central America); Pacific (Vietnam, Korea, China) to provide assistance in development and implementation of integrated Watershed Resource Management Programs to reduce nutrient loading	Initiate a technical assistance program with selected countries in the wider Caribbean Region (SIDs/Central America); Pacific (vietnam, Korea, China) to provide assistance in development and implementation of integrated Watershed Resource Management Programs to reduce nutrient loading	Initiate a technical assistance program with selected countries in the wider Caribbean Region (SIDs/Central America); Pacific (Vietnam, Korea, China) to provide assistance in development and implementation of integrated Watershed Resource Management Programs to reduce nutrient loading
		Caribbean, Pacific, Global	Design and lead improved social and economic monitoring for coral reef protected areas in five priority regions (Caribbean, WPacific, Spacific, East Africa, Red Sea)	Design and lead improved social and economic monitoring for coral reef protected areas in five priority regions (Caribbean, WPacific, Spacific, East Africa, Red Sea)	Design and lead improved social and economic monitoring for coral reef protected areas in five priority regions (Caribbean, WPacific, Spacific, East Africa, Red Sea)	Design and lead improved social and economic monitoring for coral reef protected areas in five priority regions (Caribbean, WPacific, Spacific, East Africa, Red Sea)	Design and lead improved social and economic monitoring for coral reef protected areas in five priority regions (Caribbean, WPacific, Spacific, East Africa, Red Sea)
		Caribbean, Pacific, Global			Transfer integrated assessment technology to other countries (Caribbean, Pacific, Indian and other)	Transfer integrated assessment technology to other countries (Caribbean, Pacific, Indian and other)	Transfer integrated assessment technology to other countries (Caribbean, Pacific, Indian and other)

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Improve and Maintain the viability of Marine and Coastal Ecosystems (cont.)	**Develop and Exchange US best practices to improve ecosystem based approaches to management through coordination and integration of coastal area management, marine protected areas, and coral ecosystem management globally (cont.)**	Global			Pioneer training for managing maritime heritage resources within MPAs (partners may include the EU) and specific locations TBD but likely focused on eastern Europe and developing countries.	Continue training for managing maritime heritage resources within MPAs	Continue training for managing maritime heritage resources within MPAs
		Global	Bilateral agreement between NOAA and IFREMER	Bilateral agreement between NOAA and IFREMER	Bilateral agreement between NOAA and IFREMER	Bilateral agreement between NOAA and IFREMER	Bilateral agreement between NOAA and IFREMER
		Global				Develop web-based portal for NOS stewardship products	Develop web-based portal for NOS stewardship products
	Develop and Exchange modeling and predictive capabilities to enhance ecosystem based approaches to management by understanding and managing the impacts of contaminants, diseases, and nutrient enrichment, with special emphasis on harmful algal blooms	Caribbean & Pacific	Provide technical assistance to countries in the Wider Caribbean (SIDS; Central America) Pacific (Vietnam, Korea, China) to develop programs to reduce or control polluted run-off in coastal environments	Provide technical assistance to countries in the Wider Caribbean (SIDS; Central America) Pacific (Vietnam, Korea, China) to develop programs to reduce or control polluted run-off in coastal environments	Provide technical assistance to countries in the Wider Caribbean (SIDS; Central America) Pacific (Vietnam, Korea, China) to develop programs to reduce or control polluted run-off in coastal environments	Provide technical assistance to countries in the Wider Caribbean (SIDS; Central America) Pacific (Vietnam, Korea, China) to develop programs to reduce or control polluted run-off in coastal environments	Provide technical assistance to countries in the Wider Caribbean (SIDS; Central America) Pacific (Vietnam, Korea, China) to develop programs to reduce or control polluted run-off in coastal environments

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Improve and Maintain the viability of Marine and Coastal Ecosystems (cont.)	**Develop specific regional initiatives to reduce key threats and build resilient marine and coastal ecosystems including a "Resilient Caribbean Ecosystem and communities" initiative that integrates NOS/NOAA delivery of products and best management practices in this and other priority target regions**	Caribbean	Develop specific FY09-14 regional initiatives	Develop specific FY09-14 regional initiatives	Implement specific FY09-14 regional initiatives	Implement specific FY09-14 regional initiatives	Implement specific FY09-14 regional initiatives
		Caribbean	Develop guidelines for economic incentives for effective coral reef protected areas	Complete guidelines for economic incentives for effective coral reef protected areas			
		Global	Develop guidelines for effective enforcement and community involvement in coral reef protected areas	Complete guidelines for effective enforcement and community involvement in coral reef protected areas			

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Mitigate and Adapt to Impacts of Climate Change and Vulnerability	**Develop and share tools to understand ecosystem resilience to climate variability and change and their impacts on coastal communities, including ocean acidification, sea level rise, and coral bleaching prediction**	Caribbean			Promote watershed management as a climate change adaptation strategy in the wider Caribbean region	Promote watershed management as a climate change adaptation strategy in the wider Caribbean region	Promote watershed management as a climate change adaptation strategy in the wider Caribbean region
		Caribbean				Apply the domestic Ocean Acidification modeling capability internationally	Apply the domestic Ocean Acidification modeling capability internationally
		Caribbean & Pacific	Expand/Enhance development of ocean hot spot/coral bleaching prediction capability	Expand/Enhance development of ocean hot spot/coral bleaching prediction capability	Expand/Enhance development of ocean hot spot/coral bleaching prediction capability	Expand/Enhance development of ocean hot spot/coral bleaching prediction capability	Expand/Enhance development of ocean hot spot/coral bleaching prediction capability
		Caribbean & Pacific	Train MPA managers in the Caribbean and Pacific for the "Reef Management Guide to Coral Bleaching and remote sensing tools	Train MPA managers in the Caribbean and Pacific for the "Reef Management Guide to Coral Bleaching and remote sensing tools	Support implementation of Coral Bleaching Response Plans at pilot sites (Caribbean, Pacific)	Support implementation of Coral Bleaching Response Plans at pilot sites (Caribbean, Pacific)	Support implementation of Coral Bleaching Response Plans at pilot sites (Caribbean, Pacific)
		Global	Increase use of buoys, remote sensing and other specific methods to measure shoreline change and support GLOSS activities	Increase use of buoys, remote sensing and other specific methods to measure shoreline change and support GLOSS activities	Increase use of buoys, remote sensing and other specific methods to measure shoreline change and support GLOSS activities	Increase use of buoys, remote sensing and other specific methods to measure shoreline change and support GLOSS activities	Increase use of buoys, remote sensing and other specific methods to measure shoreline change and support GLOSS activities
		Global	Assess and identify information needs for developing adaptation management tools	Assess and identify information needs for developing adaptation management tools	Collaborate with partners to build a one-stop shopping place for information	Collaborate with partners to build a one-stop shopping place for information	Collaborate with partners to build a one-stop shopping place for information
	Develop and share Tools for adaptive management working with the coastal management and MPA communities, in particular in the Caribbean and Pacific						

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Reduce Vulnerability to natural and Anthropogenic Hazards	**Develop NOAA international marine debris strategy**	Caribbean & Pacific		Provide technical assistance to research, remove and prevent marine debris in the Pacific and Caribbean	Provide technical assistance to research, remove and prevent marine debris in the Pacific and Caribbean	Provide technical assistance to research, remove and prevent marine debris in the Pacific and Caribbean	Provide technical assistance to research, remove and prevent marine debris in the Pacific and Caribbean
		Global	Develop NOAA International Marine Debris Strategy	Finalize NOAA International Marine Debris Strategy			
		Caribbean			Expand components of safe Seas Emergency Response Exercise to engage international community; specifically bordering nations (Mexico, Canada, Caribbean basin)		
		Caribbean	Expand and improve methodology for coastal evacuation route planning to specific regions	Expand and improve methodology for coastal evacuation route planning to specific regions			

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Reduce Vulnerability to natural and Anthropogenic Hazards (cont.)	**Share NOS tools and methodologies in hazard prediction, preparedness, mitigation and response with priority regions and countries**	Pacific	Support Pacific Risk Management 'Ohana (PRIMO)	Support Pacific Risk Management 'Ohana (PRIMO)	Support Pacific Risk Management 'Ohana (PRIMO)	Support Pacific Risk Management 'Ohana (PRIMO)	Support Pacific Risk Management 'Ohana (PRIMO)
		Caribbean & Pacific			Advance capacity for response and assessment mitigation and Caribbean and Micronesia reef ecosystem (edit)	Advance capacity for response and assessment mitigation and Caribbean and Micronesia reef ecosystem (edit)	
		Caribbean & Pacific	Determine what tools and training are needed				
		Other	Provide training on Coastal Community Resilience Initiative (Indian Ocean)	Provide training on Coastal Community Resilience Initiative (Indian Ocean)			

NOS International Strategy Goals	Action	Region	FY2007	FY2008	FY2009	FY2010	FY2011
Promote Safe and Environmentally Sound Navigation	**Facilitate Improvement of Wider Caribbean and Latin American regional hydrographic and cartographic capacity by collaborating in activities that demonstrate the importance of hydrographic information for safe navigation, protection of the marine environment and sustainable growth**	Caribbean	Use internationally accepted procedures to determine EEZ and offshore maritime boundaries where U.S. waters intersect or border other countries, use common standards for bathymetric data collection and for transformations between vertical reference datums	Use internationally accepted procedures to determine EEZ and offshore maritime boundaries where U.S. waters intersect or border other countries, use common standards for bathymetric data collection and for transformations between vertical reference datums	Use internationally accepted procedures to determine EEZ and offshore maritime boundaries where U.S. waters intersect or border other countries, use common standards for bathymetric data collection and for transformations between vertical reference datums		
		Global	Identify and expand international training and research opportunities for NOAA personnel	Identify and expand international training and research opportunities for NOAA personnel	Identify and expand international training and research opportunities for NOAA personnel	Identify and expand international training and research opportunities for NOAA personnel	Identify and expand international training and research opportunities for NOAA personnel
	Integrate environmental, navigational and geospatial information in marine and coastal management, navigation policy, maritime infrastructure development and management tools.	Global	Help regional countries identify potential opportunities for linking bathymetric, shoreline, geodetic and water level reference data with on-going or planned projects.	Help regional countries identify potential opportunities for linking bathymetric, shoreline, geodetic and water level reference data with on-going or planned projects.	Help regional countries identify potential opportunities for linking bathymetric, shoreline, geodetic and water level reference data with on-going or planned projects.	Help regional countries identify potential opportunities for linking bathymetric, shoreline, geodetic and water level reference data with on-going or planned projects.	Help regional countries identify potential opportunities for linking bathymetric, shoreline, geodetic and water level reference data with on-going or planned projects.
	Improve education and training of commerce and transportation operators worldwide	Global			Complete NOAA's Training Module for the World Maritime University		

Appendix IV. Glossary of Abbreviations and Acronyms

AGM	NOAA Annual Guidance Memo for guidelines on Strategic Planning
CARICOM	Caribbean Community
CEC	North American Agreement on Environmental Cooperation, Commission on Environmental Cooperation
CEST	UJNR Coastal Environmental Science and Technology Panel
CPO	NOAA Climate Program Office
CRCA	Coral Reef Conservation Act
CZMA	Coastal Zone Management Act
ECDIS	Electronic Chart Display and Information System
ELT	NOS Executive Leadership Team
FIG	International Federation of Surveyors or Fédération International des Géomètres
GEOS	UN Global Earth Observing System of Systems
GOOS	Global Ocean Observing System
GPA	UNEP Global Programme of Action
IAC	NOAA International Affairs Council
IAG	International Association of Geodesy
IEOS	U.S. Integrated Earth Observation System
IFREMER	French Research Institute for Exploitation of the Sea
IGOS	The Integrated Global Observing Strategy
IHO	International Hydrographic Organization
IJC	International Joint Commission Between Canada and the USA
IMO	International Maritime Organization
IOC	U.N. Intergovernmental Oceanographic Commission
IOOS	NOAA's Integrated Ocean Observing System Program
MEA	Millennium Ecosystem Assessment
MOMAF	Republic of Korea's Ministry of Maritime Affairs and Fisheries
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MTS	U.S. Marine Transportation System
NICC	NOS International Coordination Council
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NWHI	Northwestern Hawaiian Islands Marine National Monument
OAP	President Bush's U.S. Ocean Action Plan
OPA	Oil Pollution Act of 1990

PPBES	NOAA Program Planning, Budgeting, and Execution System
UJNR	US-Japan Cooperative Program in Natural Resources
UN	United Nations
UNEP	UN Environmental Programme
USDOS	US Department of State (or DOS)
VDatum	NOAA software tool for transformation of height data from one vertical datum into another
WW2BW	White Water to Blue Water Initiative